

CHAPTER 5. BIOLOGICAL RESOURCES MANAGEMENT

5.1 Wetland Management

Wetlands are periodically or permanently inundated by surface or groundwater and support vegetation adapted for life in saturated soil (US Army Corps of Engineers (USACE) 1985 and Executive Order (EO) 11990). Wetlands are an integral part of the ecosystem by providing a variety of functions to support ecosystem health including moderating extremes in waterflow, aiding natural purification of water, and maintaining ground water. Wetlands are nursery areas for many wildlife and aquatic species. Additionally, wetlands are unique ecological areas, are high in aesthetic value, and support a variety of recreational activities such as fishing, hunting, and bird watching.

5.1.1 Wetland Management Program Goals and Objectives

Wetland management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Wetland management goals and objectives are:

- Implement an effective wetland management plan that will maintain and enhance the health, productivity and biological diversity of wetland ecosystems.
- Attain goals by applying management prescriptions listed in the wetland management action plan.
- Ensure that US Army Alaska (USARAK) is in compliance with all applicable federal and state laws and regulations regarding wetlands.
- Provide wetland areas for realistic military training, while maintaining ecosystem integrity and minimizing impacts to wetlands.
- Apply management prescriptions to all Fort Wainwright user groups: military, recreationalists, Directorate of Public Works (DPW), and Alaska Fire Service (AFS).
- Promote early coordination between installation staff and the Environmental Resources Department (ERD) to prevent adverse impacts to wetlands.
- Provide a customer-friendly process to initiate wetland permits for military exercises or construction.

Wetland management on Fort Wainwright is implemented on the primacy of completing the military mission and the belief that effective training can be accomplished with minimal long-term environmental damage while complying with applicable laws and regulations. Effective training and environmental stewardship are compatible and necessary for the maintenance of a quality military training environment and protection of sensitive wetland areas.

5.1.2 Wetland Management Plan

Description and Justification: Prepare, update, and implement a wetland management action plan for Fort Wainwright. Due to the importance and extent of wetlands found on Fort Wainwright, a wetland management plan is necessary to give direction and establish policy for the use, maintenance, and restoration of wetlands. The wetland management action plan supports the military mission and works in conjunction with the Fort Wainwright Integrated Natural Resources Management Plan (INRMP). Implementation of an effective wetland management plan would maintain and enhance the health, productivity, and biological diversity of wetland ecosystems. Updates of the wetland management plan are required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a wetlands management plan.
- Effectively protect sensitive wetlands while allowing military use in low function wetlands.
- Involve agencies in wetland planning and provide for public review.

Management History: The first wetland management and action plan was completed in 2001.

Current Management: Current management actions to update the wetland management plan will cease in 2002. If this INRMP is not approved and funded, no new wetland management plan will be prepared, updated, or implemented. Policies already in place in the current wetland management plan will continue.

Proposed Management:

Table 5-1. Wetland Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct annual updates of the wetland management action plan.	USARAK Conservation	High	x	x	x	x	x
Prepare and update wetland management action plan for the planning period of 2007-2011.	USARAK Conservation	High					x
Complete NEPA documentation for update.	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current wetland management plan in terms of updates at least every five years. National Environmental Policy Act (NEPA) documentation is also legally mandated.

5.1.3 Wetland Inventory and Monitoring

Two wetland inventories have been completed on Fort Wainwright: the National Wetland Inventory (NWI) by the US Fish and Wildlife Service (USFWS) and the Waterways Experiment Station (WES) inventory by the USACE. When making management decisions concerning wetlands, both inventories are utilized. In instances where a Clean Water Act (CWA) Section 404 Individual or Nationwide Wetland Permit is required, the ERD staff will utilize both inventories prior to making initial site visits. If the proposed project area is within a wetland area, as confirmed by the inventories and a site visit, ERD staff will request a Jurisdictional Determination by the USACE. Ultimately, the USACE will conduct a site visit and complete a wetland delineation for the project area. The USACE will recommend the type of wetland permit application to submit.

The Alaska Region Land Condition-Trend Analysis (AKLCTA) program is utilized to monitor military and nonmilitary use of wetlands at Fort Wainwright. In addition to quantitative monitoring through AKLCTA, ERD staff continues to conduct qualitative assessments of use during large military training field exercises. This effort prevents undue wetland damage and ensures speedy and proper wetland reclamation where necessary. Recreational use of wetlands is also monitored through the AKLCTA program and through observation by the ERD staff.

5.1.3.1 Wetland Monitoring

Description and Justification: AKLCTA methodology is utilized to monitor military and nonmilitary use of wetlands at Fort Wainwright. Through AKLCTA, information is gathered on Fort Wainwright training lands based on land use polygons (i.e. bivouac, cantonment, drop zone, airstrip/assault strip, ranges, firing point, road corridor, right of way, habitat management, excavation/ gravel pit, vehicle maneuver, and foot maneuver). Surveyors look for type of use and physical damage to the landscape. Conducting wetland monitoring is required as mitigation for the five year Section 404 Clean Water Act wetland permit for military training, by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS, and Public Law 86-797 (Sikes Act) to implement the INRMP.

Monitoring Areas: There are three general types of military use at Fort Wainwright: urban, impact (weapons training and certification) and maneuver. Wetland monitoring concentrates on wetland areas that have been used for maneuver training. Approximately 401,000 acres of Fort Wainwright are classified as maneuver military use. This use includes field training exercises involving a variety of military training maneuvers, bivouac activities and live-fire operations from permanent firing ranges.

Military training involves the movement of tracked or wheeled vehicles across terrain. Foot traffic can also be classified as a training activity. Almost all military training tasks involve the maneuver component of military use and can take place both on and off-road.

Bivouac activities are conducted at any place where a military unit stops for any length of time. This location could actually be anything from a defensive fighting position to a permanent or temporary firing point. Most often, bivouacs resemble temporary campgrounds. Activities occurring at these sites include digging, earthmoving, snowplowing, water purification, field sanitation, vehicle washing, vehicle decontamination training, and general vehicle maintenance. Facilities needed for support of these activities include field kitchens and laundry and bath facilities.

USARAK military units also conduct regular range maintenance activities including clearance of munitions and repair of targets.

Measures of Effectiveness:

- Conduct annual monitoring to comply with wetland permit during 2002-2005.
- Submit annual report to USACE to comply with wetland permit during 2002-2005.

Management History: AKLCTA has been monitoring wetland disturbance since 1996. Aerial surveys for wetland disturbance have been conducted since the 1970s.

Current Management: AKLCTA program is utilized to monitor military and nonmilitary use of wetlands at Fort Wainwright. In addition to quantitative monitoring through AKLCTA, ERD staff continues to conduct qualitative assessments of use during large military training field exercises. Recreational use of wetlands is also monitored through the LCTA program and through observation by the ERD staff. LCTA is currently approved and funded through 2002. Unless this INRMP is approved and funded, LCTA monitoring will cease in 2003.

Proposed Management:

Table 5-2. Wetland Monitoring.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Follow the Wetland Monitoring Protocol to track and record military training activities conducted in wetland areas as required by the five-year general wetland permit.	USARAK Conservation	High	x	x	x	x	
Use AKLCTA methodology to monitor military use of wetlands.	USARAK Conservation	High	x	x	x	x	x
Use AKLCTA data to apply for 5-year general wetland permit renewal.	USARAK Conservation	High	x	x	x	x	x
Continue to monitor large military training field exercises.	USARAK Conservation	High	x	x	x	x	x
Use AKLCTA methodology to monitor nonmilitary use of wetlands.	USARAK Conservation	High	x	x	x	x	x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods of monitoring wetlands. However, AKLCTA methods were developed specifically for the Alaskan ecosystems, with the specific purpose in mind of assessing wetland condition. Other methods could be developed that include collecting data at many more points per year, but these would be cost-prohibitive.

5.1.3.2 Wetland Planning Level Survey

Description and Justification: Conduct wetland planning level surveys on Fort Wainwright. The wetland survey includes a wetland classification system based on hydro-geomorphic characteristics of vegetative communities. The project includes a description of values and functions of wetlands on Fort Wainwright along with management recommendations. The NWI failed to detect many of the smaller wetlands on Fort Wainwright, which rendered it inadequate for installation natural resources management programs. Wetland surveys on Fort Wainwright are required for management of withdrawn public lands. An accurate wetland planning level surveys is required by Army Regulation (AR) 200-3 and is required to implement this INRMP as mandated by Public Law 86-797 (Sikes Act). Per Memorandum DAIM-ED-N, 21 March 1997, this planning level survey is a class 1 requirement.

Measures of Effectiveness:

- Complete, maintain, and update wetland planning level survey on Fort Wainwright.
- Identify the requirement for a wetland planning level survey in the EPR.

Management History: Planning level wetland surveys were conducted in Fiscal Year (FY) 96 for 600,000 acres on Tanana Flats Training Area (TFTA), wetland surveys were conducted on Yukon Training Area (YTA) in FY 97. The project includes digitization of all wetland boundaries.

Current Management: USARAK will develop a wetland classification system based on hydro-geomorphic characteristics of vegetative communities. The project will include a description of values and functions of wetlands on Fort Wainwright along with management recommendations. This, along with the delineation, was used to develop a wetland management plan, which was completed in 2000. Updated surveys will be required in FY 06.

Proposed Management:

Table 5-3. Wetland Planning Level Survey.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Update the wetland planning level survey.	USARAK Conservation	High					x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current wetland planning level survey. Per the Sikes Act, AR 200-3, and Memorandum DAIM-ED-N, 21 March 1997, this planning level survey must be updated every ten years.

5.1.4 Wetland Management

Description and Justification: Wetland management will help maintain proper wetland functions while allowing military training and ensure plant, wildlife and soil resources are not degraded. Implementation of wetland management will improve the quality of military training at Fort Wainwright by providing realistic training options in wetlands resulting in an overall increase training opportunities. In addition, conducting wetland management activities will reduce the amount of planning time previously needed for wetland permit applications to train in wetlands. Wetland management also establishes a basis for conservation and protection of wetlands. Conducting wetland management is required as mitigation for the five year Section 404 Clean Water Act wetland permit for military training, by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal Legislative Environmental Impact Statement (LEIS), and Public Law 86-797 (Sikes Act) to implement the INRMP.

Wetland Management Areas: USARAK has obtained a five-year general wetland permit to conduct military training in wetlands at Fort Wainwright (2000-2005). This permit allows limited maneuver or other military activities to occur in some wetland areas, a change from the past, where no activity was permitted at all. USARAK may not damage more than 40 acres per year of wetlands. If that amount is exceeded, training in wetlands will be prohibited and individuals may be liable for fines and other penalties. Restoration of all damage is mandatory.

The environmental limitations overlays were developed as a tool for planning military training activities and managing wetlands. Approved/restricted activities are listed in three color-coded categories. The environmental limitations overlay is available at range control or the Integrated Training Area Management (ITAM) office. ITAM or range staff provide instruction on use of the overlays. Each overlay is available in a summer and winter version. The three categories on the overlays are described in tables 5-4 and 5-5.

Table 5-4. Definition of Land Use Categories Used on the Environmental Limitations Overlays for USARAK during Summer Months.

Category	Approved Activity SUMMER	Limited Activity (requires approval by Range Control on a case-by-case basis)	Prohibited Activity
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Category	Approved Activity SUMMER	Limited Activity (requires approval by Range Control on a case-by-case basis)	Prohibited Activity
GREEN No limitations or restrictions	<ul style="list-style-type: none"> - Tracked, wheeled and foot maneuvers - Bivouacs - Defensive fighting positions - Digging - Earth moving - Field kitchens - Laundry and bath facilities - Water purification - Portable latrines - Slit trenches - Vehicle decontamination training - Timber cutting (under 4" in diameter) - POL distribution 	<ul style="list-style-type: none"> - Smoke generation - Fuel farms 	None
YELLOW Minor limitations or restrictions	<ul style="list-style-type: none"> - Tracked, wheeled and foot maneuvers - Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter) 	<ul style="list-style-type: none"> - Digging - Earth moving 	<ul style="list-style-type: none"> - Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution
RED Significant limitations or restrictions	<ul style="list-style-type: none"> - Foot maneuvers 	<ul style="list-style-type: none"> - Tracked and wheeled maneuvers - Stream crossings with ADF&G permit 	<ul style="list-style-type: none"> - Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter) - Mechanical digging - Earth moving - Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution

Summer Special Conditions. The red and yellow categories on these overlays each have special conditions that must be observed while training in those areas.

Green: No environmental restrictions. However, all normal procedures outlined elsewhere in this regulation should be followed. Smoke generation and fuel farms in areas represented as green on the overlay require prior approval from Range Control on a case-by-case basis.

Yellow: Notify Range Control when planning to train in yellow areas. Environmental / ITAM staff must pre-survey area. Stream crossings are permitted at 90 degree angles only.

Red: Notify Range Control when planning to use red areas. Environmental / ITAM staff must pre-survey red area to determine on-the-ground limits of each red area. Open water and streams have 50 meter buffer - NO VEHICLES IN BUFFER - FOOT MANEUVER ONLY. Stream crossings at 90 degree angle to water flow only. No stream crossing at shear or cut banks. Vehicular maneuver is not allowed except during stream crossings, which must be crossed at a 90-degree angle to the direction of the stream flow. No stream crossing at shear or cut banks. Earth moving, mechanical digging, bivouacs, assembly areas, fighting positions, timber cutting, laundry and bath sites, portable latrines, slit trenches, vehicle

decontamination, smoke generation, and any Petroleum, Oil, and Lubricant (POL) distribution are restricted in any area designated as red on the overlay.

Table 5-5. Definition of Land Use Categories Used on the Environmental Limitations Overlays for USARAK during Winter Months.

Category	Approved Activity WINTER	Limited Activity (requires approval by Range Control on a case-by-case basis)	Prohibited Activity
GREEN No limitations or restrictions	<ul style="list-style-type: none"> - Tracked, wheeled and foot maneuvers - Bivouacs - Defensive fighting positions - Digging - Earth moving - Field kitchens - Laundry and bath facilities - Water purification - Portable latrines - Slit trenches - Vehicle decontamination training - Timber cutting (under 4" in diameter) - POL distribution 	<ul style="list-style-type: none"> - Smoke generation - Fuel farms 	None
YELLOW Minor limitations or restrictions	<ul style="list-style-type: none"> - Tracked, wheeled and foot maneuvers - Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter) 	<ul style="list-style-type: none"> - Digging - Earth moving - Snowplowing - Stream crossings with ADF&G permit 	<ul style="list-style-type: none"> - Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution
RED Significant limitations or restrictions	<ul style="list-style-type: none"> - Foot maneuvers 	<ul style="list-style-type: none"> - Tracked and wheeled maneuvers - Stream crossings with ADF&G permit 	<ul style="list-style-type: none"> - Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter) - Mechanical digging - Earth moving - Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution

Winter Special Conditions. The red and yellow categories on these overlays each have special conditions that must be observed while training in those areas.

Green: No environmental restrictions. However, all normal procedures outlined elsewhere in this regulation should be followed. Smoke generation and fuel farms in areas represented as green on the overlay require approval from Range Control on a case-by-case basis.

Yellow: - Notify Range Control when training in yellow areas. Environmental / ITAM staff must pre-survey these areas. Stream crossings at 90 degree angles only. Use caution when snow plowing. Minimum of 6 inches of snow pack must remain on trails or other clearings to minimize damage to vegetation and soils. Activities limited in areas shown as yellow on the overlay include tracked and

wheeled maneuvers, bivouacs, assembly areas, defensive fighting positions and timber cutting. These activities may be approved on a case-by-case basis by Range Control and ITAM if there are no seasonal wildlife restrictions.

Red: Notify Range Control when using red areas. Environmental / ITAM staff must pre-survey areas to determine on-the-ground limits of each red area. Open water and streams have 50 meter buffer - NO VEHICLES IN BUFFER - FOOT MANEUVER ONLY. Vehicular maneuver is not allowed except during stream crossings, which must be crossed at a 90-degree angle to the direction of the stream flow. No stream crossing at shear or cut banks. Earth moving, mechanical digging, bivouacs, assembly areas, fighting positions, timber cutting, laundry and bath sites, portable latrines, slit trenches, vehicle decontamination, smoke generation, and any POL distribution (fuel farms and tankers) are restricted in any area designated as red on the overlay.

Measures of Effectiveness:

- No net loss of wetlands during 2002-2006.
- No restriction in the amount of military training during 2002-2006.
- No Notices of Violation (NOV) from use of wetlands in 2002-2006.
- Comply with five-year wetland permit during 2002-2006.
- Minimize restrictions to training from wetland management policies and issues.
- Coordinate with the USACE for all proposed actions that have the potential to impact wetlands.
- All mitigation measures identified in CWA Section 404 permits for natural resource management projects/plans are being implemented per the agreed schedule.

Management History: Wetlands protection has been strengthened by the completion of a comprehensive post-wide wetland inventory (Lichvar and Specher. 1996). Further studies to include wetland functions and values will also help provide information that will be useful in wetland protection and enhancement.

Current Management: Wetland management entails managing military, recreational, and other uses to minimize disturbance. Wetland management also includes reclamation of disturbed areas.

Wetland Use Management: To protect certain wetland areas and to prevent unpermitted damage, USARAK developed environmental limitations overlays to be used with the five-year wetland permit (figure 5-1). Use of these overlays is required when requesting to train in wetland areas in order to avoid possible fines. The overlay clarifies where certain activities that may impact training areas may be conducted. Approved/restricted activities are classified as three color-coded categories based on the presence of wetlands. The environmental limitations overlay is available at range control or the ITAM office. ITAM or range staff will provide instruction on use of overlay. Each overlay is available in a summer and winter version.

To reduce damage to wetlands within training lands from maneuver or other training activities, USARAK has implemented an Environmental Awareness (EA) program. The goal of the EA program is to foster a conservation ethic in military personnel. A variety of materials and methods are used to educate the military on a wide range of environmental issues. For example, educational briefings on environmental issues, including wetland identification, are held throughout the year and EA materials are presented at Range Control briefings, pre-command briefings and before all major field exercises.

Training Requirements Integration (TRI) is another component of the ITAM program that is implemented to minimize damage to natural resources by integrating military training requirements with land condition trends (derived from LCTA). In the case of wetland management, TRI has been accomplished by range scheduling procedures and the use of environmental limitations overlays.

Following major exercises, USARAK staff composes an After Action Report that details any significant occurrences during the exercise and distributes it to all participating units. This report serves as an educational document for the units to consider during their next large field exercise. Issues typically addressed in the report include wetland damage, POL spills, trash and debris clean-up, snowplowing, and refilling and recontouring of areas used for digging.

Outdoor recreation does impact wetlands and wetland related species (Racine et al. 1998 and Racine 1998). However, these issues are addressed in the outdoor recreation management and action plan. Brief discussions of specific actions are also included in the wetland management action plan in appendix D.

The presence of wetlands has shaped the existing development on Fort Wainwright Main Post and will continue to affect future development. Wetland areas have required and will continue to require special consideration for development. Specific goals and objectives for the future development of Fort Wainwright are based on considerations of the installation mission and findings of significant on-post and off-post conditions. Future land use requirements such as construction of buildings, parking areas, recreation facilities and future mission needs may require the filling-in of wetland areas to accommodate increased demands on existing land use areas.

If the proposed project area is within a wetland area, as confirmed by existing wetland inventories and a site visit, ERD staff will request a Jurisdictional Determination by the USACE. Ultimately, the USACE will conduct a site visit and complete a wetland delineation for the project area. The USACE will recommend the type of wetland permit application to submit.

Wetland Reclamation: Wetland reclamation projects will be coordinated through the Land Rehabilitation and Maintenance (LRAM) program, a component of ITAM. The LRAM program strives to sustain long-term training by enhancing and increasing training opportunities, repairing damaged training lands, and implementing procedures and technology to decrease future damage and long-term rehabilitation costs. LRAM incorporates professionally accepted, best management practices for all projects designed to repair, rehabilitate, and maintain wetlands in training areas. LRAM projects at Fort Wainwright focus on soil erosion control, river/stream bank stabilization, and revegetation to promote proper wetland function.

Military activities, such as cross-country maneuvers, digging of defensive fighting positions, snowplowing in winter, and bivouacs, can disturb wetland soil and vegetation. This disturbance increases the potential for soil erosion and transport. USARAK Range Regulation 350-2 and educational efforts help to minimize wetland disturbance. However, some damage may still occur. Techniques for repairing damage include installing waterbars, re-contouring areas to match surrounding area, rolling back the vegetative mat, and revegetation.

The LRAM program is also used to identify and prioritize reclamation activities in areas heavily impacted by recreational use. Impacts resulting from recreational use are similar to those resulting from military activities. Thus, similar rehabilitation measures can also be applied to these areas. Current reclamation management of recreational sites involves the maintenance of newly developed sites and the upgrade of locations to be developed for future recreational use.

Road drainage maintenance is important for controlling sedimentation. Road maintenance on training lands is generally a responsibility of DPW. Some maintenance work on roads and trails on Fort Wainwright is done through the LRAM component of ITAM.

Land rehabilitation activities will commence immediately upon initiation of wildfire suppression activities on Fort Wainwright. Minimum impact fire suppression tactics to meet suppression objectives are utilized to reduce adverse impacts to forest resources and extent of rehabilitation requirements.

Proposed Management:

Table 5-6. Wetland Management and Reclamation Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Renew application for a five-year individual wetland permit to allow military training in low function wetlands.	USARAK Conservation	High			x		
Apply for other CWA Section 404 wetland permits and ADF&G permits on an as-needed basis.	USARAK Conservation	High	x	x	x	x	x
Apply for CWA Section 404 Permits for DPW.	USARAK Conservation	High	x	x	x	x	x
Apply for CWA Section 404 Permit for recreational areas.	USARAK Conservation	High	x	x	x	x	x
Update environmental limitations overlays and associated restrictions.	USARAK Conservation	High	x	x	x	x	x
Conduct wetland determinations using NWI and WES wetland delineations.	USARAK Conservation	High	x	x	x	x	x
Implement AFS policy on prescribed burns in wetland areas.	USARAK Conservation	High	x	x	x	x	x
Conduct rehabilitation activities on damaged wetlands following military use and after fire suppression activities.	USARAK Conservation	High	x	x	x	x	x
Implement and comply with five-year general wetland permit.	USARAK Conservation	High	x	x	x	x	x
Report on amount of annual wetland disturbance to USACE.	USARAK Conservation	High	x	x	x	x	x
Conduct rehabilitation activities on damaged wetlands occurring as a result of recreational activities and DPW activities.	USARAK Conservation	High	x	x	x	x	x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods for protecting and managing wetlands. However, total exclusion of all uses from wetlands is not plausible. Military training must occur in all habitats. On the other hand, no limitations on the use of wetlands could permanently damage the ecosystem. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or cost-prohibitive.

5.1.5 Wetland Management Responsibilities

Range Control, a component of DPTSM, is the primary authority for regulating military land use and various stipulations of the permits. Range Control's authority to schedule training facilities and conduct range inspections initiates from the Installation Commander. USARAK Range Regulation 350-2 details acceptable conduct during training exercises in the field to reduce negative environmental impacts.

USACE is the authority for insuring compliance with the requirements of Section 404 of the Clean Water Act, which regulates use of wetland areas. As such, USACE will conduct random follow-up inspections on a representative sample of disturbed wetlands to insure compliance with the five-year general permit and other permits as issued.

5.2 Forest Management

Forest management is required to protect, maintain, and enhance military training environments. Tree density, ground cover, and other factors within the forest ecosystem are critical to the accomplishment of the military mission. In addition, management of the forest ecosystem is important to maintain biodiversity, wildlife habitat management, and the development of outdoor recreation.

5.2.1 Forestry Program Goals and Objectives

Forestry goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Forestry goals and objectives are:

- Manage vegetation and timber in support ecosystem management objectives.
- Manage vegetation and timber in support of military range upgrade projects.
- Manage vegetation and timber to enhance recreational opportunities.

The objectives for meeting the forestry program goals are:

- Maintain a current inventory of forest and vegetative resources.
- Conduct forestry planning.
- Implement forest management practices through timber stand improvement, timber management, timber sales, and timber salvage cuts.
- Control forest pests.
- Provide firewood for local military and civilian population.
- Conduct commercial timber sales only as a tool to meet the above goals.

5.2.2 Forest Management Plan

Description and Justification: Prepare, update, and implement a forest management action plan for Fort Wainwright. The forest management plan will consider public safety, preservation of habitat, and recreation. Harvests of timber products from Fort Wainwright are permitted, but not mandatory. Management of the forest ecosystem is one of the most critical aspects of land management on the installation due to the high percentage of forested land and its importance to wildlife. The management of forest and woodland resources on Fort Wainwright is consistent with ecosystem management principles. The Fort Wainwright Resource Management Plan (BLM and U.S. Army, 1994) requires the development of a forest management plan that is compatible with achieving the military mission. Updates of the forest management plan are required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a forest management plan.
- Maintain and enhance the health, productivity and biological diversity of forest and woodland ecosystems.
- Maintain a diverse forest to enhance a varied military training environment.
- Involve resources agencies in planning for forest management and the public in review of the plan.

Management History: The first forest management plan for Fort Wainwright was completed in 2001.

Current Management: Total land area available for forest management is 374,678 acres (Tanana Chiefs Conference, 1993). The forest management plan must account for completing the military mission. It must also consider ecosystem management principles of preservation and manipulation of habitat, conservation of wildlife, outdoor recreation, and public safety. The current plan addresses allowable harvest levels, reforestation methods, and appropriate silvicultural methods by measuring the impact of each on military needs, recreational opportunities, and economic considerations. Current management actions to update the forest management plan will cease in 2002. If this INRMP is not approved and funded, no new forest management plan will be prepared, updated, or implemented. Policies already in place in the current forest management plan will continue.

Proposed Management:

Table 5-7. Forest Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct annual updates of the forest management action plan.	USARAK Conservation	High	x	x	x	x	x
Prepare and update forest management action plan for the planning period of 2007-2011.	USARAK Conservation	High					x
Complete NEPA documentation for update	USARAK Conservation	High					x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current forest management plan in terms of updates at least every five years. NEPA documentation is also legally mandated.

5.2.3 Forest Inventory

Description and Justification: Forest inventory involves the identification and delineation of species, size class and density of forest and other vegetative resources. USARAK utilizes the Ecological Land Classification for Fort Wainwright as the basis for identifying general species locations throughout the installation. Within ecological land classification units known as ecosites, stands are delineated through a combination of field surveys, air photo interpretation, satellite imagery and GIS. Stands are sampled to determine tree species composition, size class distribution, canopy cover, stem density, basal area, regeneration composition and density, and merchantable volumes by species. This information is essential for effective management of forest resources.

Recent requests from the public indicate the need to conduct forest inventories on Fort Wainwright to determine if there are sufficient resources to support a commercial forest program. The Sikes Act requires those withdrawn lands, such as at Fort Wainwright, be included in INRMP planning and program implementation, including forest management. Conducting forest inventory is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal legislative EIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Management Areas: Permanent plot locations and intensity will be systematically stratified by forest type across the landscape. YTA will be inventoried in the summer of 2002, 2003, and 2004, starting west and working east. Training areas 1 and 2 will be given the highest priority, then moving into training areas 3, 4, and 5, and finishing with training areas 6 and 7. Analysis of stand data, including maps and reports, for YTA will be completed in the winters of 2002, 2003, and 2004. TFTA will be inventoried in the summer of 2004, 2005, and 2006. Analysis of stand data, including maps and reports, for TFTA will be completed in the winter of 2004, 2005, and 2006.

Forest inventory will be conducted in the following areas with the following priorities (figure 5-2). Continuous forest inventory plots are also shown on figure 5-2.

Measures of Effectiveness:

- Maintain current and accurate spatial and tabular data on forest resources on Fort Wainwright.

Management History: Total land area available for forest management is 374,678 acres (Tanana Chiefs Conference, 1993). Beginning in 1999, USARAK began an annual inventory of 10% (about 37,000 acres) of lands that may have viable commercial forest values. This inventory used ecological land classification units to delineate and sample stands to determine merchantable volumes by species. The inventory will delineate areas within the Main Post where Christmas trees and quality firewood are available. Main Post lands will be inventoried early in the process since USARAK directly controls forest management on these lands.

Current Management: USARAK utilizes the Ecological Land Classification for Fort Wainwright as the basis for identifying general species locations throughout the installation. Within ecological land classification units known as ecosites, stands are delineated through a combination of field surveys, air photo interpretation, satellite imagery and GIS. Stands are sampled to determine tree species composition, size class distribution, canopy cover, stem density, basal area, regeneration composition and density, and

merchantable volumes by species. This information is essential for effective management of forest resources.

Continuous forest inventory plots (CFI) are also located throughout the forested areas of Fort Wainwright training lands. These permanent plots are an effective method for detecting changes in forest health, composition, structure, forest fire fuel loading, and determining growth and mortality, which can be applied in growth projection models. Periodic measurement of permanent sample plots is statistically superior to successive independent inventories for evaluation of changes in forest conditions. Permanent plot locations and intensity will be systematically stratified by forest type across the landscape.

Inventories will be conducted by forestry crews from the USARAK Conservation Forestry Office with equipment purchased for the purpose of conducting these inventories. Procedures for permanent plots will follow established protocols from the USFS Forest Inventory and Analysis Lab. Permanent plots will be remeasured every five to ten years. The periodic remeasurement of permanent sample plots is statistically superior to successive independent inventories for evaluation of changes in forest conditions.

Current inventory actions will continue if this INRMP is not approved and funded. However, no new inventory methods will be prepared, updated, or implemented.

Proposed Management:

Table 5-8. Forest Inventory.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct forest inventory on 10% of Fort Wainwright lands per year that may have viable commercial forest value.	USARAK Conservation	High	x	x	x	x	x
Conduct continuous forest inventory plot monitoring on 100 CFI plots per year.	USARAK Conservation	High	x	x	x	x	x
Prepare annual forestry report.	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods of conducting forest inventory. However, proposed methods for conducting forest inventory were developed specifically for the Alaskan ecosystems. Other methods could be developed that include collecting data at many more points per year, but these would be cost-prohibitive.

5.2.4 Forest Management

The objective of the USARAK silvicultural program is to promote a healthy ecosystem capable of supporting the military mission and conservation requirements. Silvicultural treatments are designed to restore, maintain, and improve the ecological functions and values of the particular forest unit being managed. Silvicultural treatments used will improve military mission areas, and, when possible, attain multiple use and sustained yield timber management while enhancing watersheds, wildlife habitats, and natural beauty values along scenic corridors. When silvicultural treatments provide opportunity for commercial sale of forest products, each commercial forest activity will be performed in accordance with 10 USC 2665, and operating expenses will be commensurate with anticipated financial returns on lands the on which the Army holds vegetation rights.

Silvicultural systems used will be consistent with the silvics of the species and ecology of the forest type, maintain the site's productivity, and be chosen to best achieve the management objectives. In general, boreal forests naturally occur as even-aged stands across the landscape, and the preferred management scheme is to maintain a diverse mosaic of even-aged stands. A variety of silvicultural systems will be used, including uneven-aged management on a limited basis, in order to achieve the desired management objective. Timber harvesting areas will be sized and configured to best meet silvicultural, wildlife, scenic, military, and other specific objectives of the area. Harvest methods can include intermediate partial cuts prior to the final stand renewal reproduction cuts.

Description and Justification: Timber, fuelwood, or Christmas tree sales will be used to accomplish military or ecosystem objectives. Timber stand improvement, timber management, timber sales, and timber salvage cuts are utilized as a tool to accomplish habitat improvement or to improve the commercial value of forest tree species. Forest ecosystem management is necessary to support military training by reducing forest density and implementing habitat management. Ecosystem management will support increased biodiversity. Conducting forest management is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Table 5-9. Forest Management Areas.

Management Areas	Priority	Size
Forest management areas	High priority for forest management	22,000 acres
	Medium priority for forest management	96,000 acres
	Low priority for forest management	100,000 acres
Forest protection areas	No forest management	157,000 acres
Non-forested areas	No forest management	240,800 acres

Measures of Effectiveness: Meeting military mission requirements will remain the primary objective of forest management during 2002-2006. Future management of the forest ecosystem on Fort Wainwright will:

- Support the military mission
- Protect ecosystem functionality
- Sustain production of forest products
- Provide quality recreational opportunities.
- Minimize restrictions to training from forest management policies and issues.

Management History: Fort Wainwright's forestry program has emphasized the sale of Christmas trees and firewood as well as urban landscaping on Main Post. Future management of the forest ecosystem on Fort Wainwright will be geared toward supporting the military mission, protecting ecosystem functionality, sustainable production of forest products, and providing quality recreational opportunities.

Current Management: Forest management does not just involve commodity production, protection of sensitive habitats and needs of the military for cover and concealment are primary objectives. It is important to maintain a wide variety of ages and species, protect and develop old growth, protect watersheds, and protect options for future management. The components of forest management on Fort Wainwright include timber removal for military mission support, timber stand improvement, forest regeneration, timber management, timber sales, and forest disease/insect prevention.

Conduct Timber Removal for Military Mission Support: The military needs to train personnel under certain environmental conditions. This may require the removal of trees to create open areas for drop zones, small arms firing ranges, or construction. Thinning stands of trees to allow maneuverability in certain areas may also be necessary.

USARAK natural resources personnel have two choices when there is a need to clear or thin timber with commercial value on withdrawn lands. They can request support from BLM to conduct a timber sale, or they can remove the trees without selling them (by cutting or burning) upon approval from BLM and after NEPA analysis. Troops are permitted to harvest forest products to achieve training objectives. Trees less than four inches diameter at breast height (dbh) may be cut without prior approval. Removal of larger trees on approved sites requires Natural Resources Branch coordination. Stumps must be less than six inches high. (U.S. Army, Alaska. 1994).

Timber Stand Improvement: Timber Stand Improvement (TSI) is designed to improve species composition, quality, and/or growth rate of existing stands by removing competing vegetation to allow preferred trees to grow at faster rates. TSI is often categorized as noncommercial activities used to improve the quality of commercial timber, but it may also be used to improve forest conditions for other uses. TSI may include thinning, chemical injection, prescribed burning, etc., all of which are designed to improve species composition, quality, and/or growth rate of existing stands by removing competing vegetation to allow preferred trees to grow faster.

Forest Regeneration: Regeneration of forests, either natural or planned, is an essential part of forest ecosystem development. Regeneration of forests can be made through planting seedlings, planting sprigs, coppice cuts or seeding.

Timber Management: Timber management is the art and science of managing vegetation and timber to meet ecosystem management objectives while maximizing the commercial value of the timber that must be cut to meet those objectives. Management of white spruce should be conducted on a 120-year rotation, and birch pole timber should be conducted on an 80-year rotation. Black spruce is not suitable for commercial management at this time. Timber should be harvested using the most appropriate techniques for the target species: selective harvest, shelter wood, seed tree, or reproduction harvest. *Calamagrostis* infestation of cut sites is a problem on all harvest sites. Early regeneration is the key to preventing *Calamagrostis* infestation

Timber Sales: The removal and/or thinning of timber on portions of Fort Wainwright could improve conditions for conduct of the military mission and enhance the local economy. The Fort Wainwright Resource Management Plan (BLM and U.S. Army. 1994) requires that timber sales on Fort Wainwright be governed by common BLM and USARAK timber management practices, contract stipulations, and the mandates of the state's forest practices regulations. Common requirements include:

- Construction, improvement, and maintenance of safe and environmentally-sound road systems.
- Felling and yarding of timber in such a way as to protect soil and water quality, residual trees, and human safety.
- Treatment of logged sites to prepare them for the next generation of trees.
- Disposal of logging slash for silvicultural and/or fire hazard reduction purposes.
- Mitigation measures for protecting wildlife habitat.
- Other miscellaneous provisions where appropriate, such as meeting minimum fire requirements and application of disease control measures.

Harvest plans would be prepared prior to commercial sales of forest products. Plans would include sale boundaries, cruised volume, silvicultural prescription, road layout, best management practices for

prevention of soil erosion and sedimentation, water quality considerations, cultural resources protection, wildlife considerations, harvest method(s), scaling requirements, slash disposal, site preparation, and regeneration requirements. A USARAK wildlife biologist would assist with plans for timber sales to ensure consideration of wildlife habitat values. Documentation for compliance with NEPA as well as required cultural resources surveys would be completed prior to sales.

Forest Disease/Insect Prevention: The spruce bark beetle (*Dendroctonus rufipennis* (Kirby)) is becoming more significant on Fort Wainwright in terms of its effects on the forest ecosystem. ADNR estimates that 30%-50% of forest stands older than 150 years are infected in the Fort Wainwright area. One result of spruce bark beetle outbreaks is increased fire danger. Standing dead timber generally falls within 10 years, creating up to 40 tons of fuel per acre on the ground.

The best prevention tactic to reduce spruce bark beetle damage is managing for a diversity of species and age classes within the forest. The combination of mature spruce and a reduction in natural disturbance is ideal for the spruce bark beetle and associated changes in the forest ecosystem. (Dr. Edward Holsten, 1998.). Thus, TSI and prescribed burning would reduce susceptibility to the spruce bark beetle.

The spruce budworm (*Choristoneura* sp.), an insect that defoliates trees, could be a serious pest species with regard to forest ecosystems in interior Alaska. The ADNR (Peter Buenau and Stephen Claudice, 1998) estimates that 20,000 acres of young and old trees west of Fairbanks are infested. According to Holsten et al. (1985), the Fairbanks area is the furthest north this insect has been found in Alaska. These outbreaks have been very limited and cause relatively little damage. Large-scale control is neither needed nor feasible. This pest is not a significant problem on Fort Wainwright.

A species of engraver beetle (*Ips* sp.) is found throughout Alaska, but it is most prevalent in the Interior. *Ips* favors sites with accumulation of slash, which has not been a factor on Fort Wainwright. *Ips* outbreaks usually develop and disappear rapidly, precluding the need for direct control operations (Holsten et al. 1985).

There are no other forest insects or diseases known on Fort Wainwright. Holsten et al. (1985) describes important insects and diseases that affect forests in Alaska.

Current forest management actions will continue if this INRMP is not approved and funded. However, no new management actions will be prepared, updated, or implemented.

Proposed Management:

Table 5-10. Forest Management Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct timber management on Fort Wainwright.	USARAK Conservation	High	x	x	x	x	x
USARAK will remove or thin up to 400 acres of trees or shrubs per year to support military training activities.	USARAK Conservation	High	x	x	x	x	x
Conduct timber stand improvement on a maximum of 100 acres per year of timber stand improvement.	USARAK Conservation	High	x	x	x	x	x

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct salvage cuts on up to 400 acres per year.	USARAK Conservation	High	x	x	x	x	x
Conduct forest pest protection on up to 200 acres per year.	USARAK Conservation	High	x	x	x	x	x
Provide fuelwood and Christmas trees to military and public annually.	USARAK Conservation	High	x	x	x	x	x
Conduct timber sales and cut up to a maximum of 20,000 board feet per year.	USARAK Conservation	High	x	x	x	x	x
ADF&G review of all actions affecting streambanks	USARAK Conservation	High	x	x	x	x	x
Complete NEPA and Section 106 documentation	USARAK Conservation	High	x	x	x	x	x
Apply for Section 404 permits as required	USARAK Conservation	High	x	x	x	x	x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods for managing forests. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost-prohibitive.

5.2.5 Forestry Responsibilities

Under Public Law 106-65, BLM retains vegetative and mineral rights for the YTA. Any vegetation manipulation by USARAK must be approved by BLM. BLM and USARAK timber management practices, contract stipulations, and the mandates of the state's forest practices regulations would govern the sale of timber from these lands.

Forests on withdrawals in the YTA and the TFTA fall under BLM's restricted category for management, that is, management of the withdrawal is primarily for the military, but timber harvests are permitted. Members of the public may approach BLM for a permit to purchase timber on withdrawn lands, but each timber sale must be approved by the military. On the Main Post and sections of the YTA where the Army holds vegetation rights, members of the public must get a permit from Fort Wainwright's Conservation Branch to harvest timber.

Timber removal and other forest management practices on all of Fort Wainwright will be coordinated with Range Control to ensure minimal disruption of military training. Scheduling usually will be done three to six months in advance of activities. Appropriate NEPA documentation will be completed prior to implementation of timber stand improvement projects.

5.3 Fire Management

Interior Alaska ecosystems require fire for continued functionality. However, wildfires are a concern at Fort Wainwright due to their impact on human activities and structures, and military operations. Fire has been a natural force in the Alaska interior for thousands of years. It is a key environmental factor in these cold-dominated ecosystems. Without fire, organic matter accumulates, the permafrost table rises, and ecosystem productivity declines. Vegetation communities become much less diverse, and animal species normally associated with certain successional stages find the environment unsuitable. Fire rejuvenates these ecosystems. It removes some insulating organic matter, resulting in a warming of soils. Nutrients are added to the soil from ash and increased decomposition rates. Vegetation re-growth quickly occurs, and the cycle begins again.

5.3.1 Fire Management Goals and Objectives

Fire management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Fire management goals and objectives are:

- Protect human lives and the military mission, but not the land from fire.
- Unauthorized structures will be allowed to burn during wildfires. AFS will be notified of the locations of all known illegal structures and known hazardous contents.
- Use prescribed burning to manage natural resources and reduce wildfire losses.

5.3.2 Fire Management Plan

Description and Justification: Write, update, and implement a fire management plan for Fort Wainwright. The fire management plan provides the planning framework for all fire management decision-making, and specifies the use of fire consistent with and to enhance land management objectives. The plan would reduce forest fire hazard caused by incendiary type weapons and will enhance habitat as part of ecosystem management. Training is essential to the U.S. Army's mission of preparedness and military readiness. Fire management has become an increasing concern on training sites in recent years as the activities associated with training increases the risk of unplanned fire ignitions with the use of ammunition and pyrotechnics. This document provides guidance and direction to establish an effective fire management program and the eventual development of a fire management plan that fulfills interagency guidelines. This document identifies responsibilities and standard practices for fuels management, pre-suppression, prevention, and suppression while supporting military preparedness along with BLM and USARAK resources management goals.

Updates of the fire management plan are required by the Memorandum of Understanding between BLM and USARAK concerning the Management of Certain Public Lands Withdrawn for Military Use and the Interdepartmental Support Agreements WC1SH3-95089-502 and 140138-95089-905 between USARAK and BLM, Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a fire management plan.
- Establish fire management procedures and protocols to provide USARAK the capability to complete its mission to maintain combat readiness and fulfill resources management intent.

- Maintain and enhance the health, productivity and biological diversity of the ecosystem through fire suppression, fire prevention, and prescribed fire planning.
- Involve resources agencies in planning for fire management and provide public review.

Management History: The first fire management action plan was completed in 2001.

Current Management: Current management actions to update the fire management plan will cease in 2002. If this INRMP is not approved and funded, no new fire management plan will be prepared, updated, or implemented. Policies already in place in the current fire management plan will continue.

Proposed Management:

Table 5-11. Fire Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct annual updates of the fire management action plan.	USARAK Conservation	High	x	x	x	x	x
Prepare and update fire management action plan for the planning period of 2007-2011.	USARAK Conservation	High					x
Complete NEPA documentation for update	USARAK Conservation	High					x
Develop an Interagency Fire Management Plan that adheres to guidelines outlined by the Interagency Wildland Fire Coordinating Group.	BLM Alaska Fire Service	High		x			
Develop pre-suppression plans for each of the area units of Fort Wainwright.	BLM Alaska Fire Service	Medium		x			
Develop plans for proposed prescribed fires on Fort Wainwright.	BLM Alaska Fire Service	Medium		x			
Develop plans and fuel treatment projects to reduce the threat of fires starting on military lands and impact areas and burning onto adjacent lands of high resource value.	BLM Alaska Fire Service	Medium		x			
Develop generic burn plan for various military directorates to use for grounds maintenance projects.	BLM Alaska Fire Service	Medium		x			
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current fire management plan in terms of updates at least every five years. NEPA documentation is also legally mandated.

5.3.3 Fire Management Inventory

Description and Justification: Fire management inventory includes monitoring forest fuel hazards as well as mapping past fires. This information is extremely useful for managing and decision-making during fire events. Past fire history also is an important input into habitat management decision-making. Conducting fire management inventory is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Management Areas: Fire history on Fort Wainwright is shown in figure 5-3.

Measures of Effectiveness:

- Maintain a complete history of fires on Fort Wainwright.
- Identify potential forest fuel hazard on Fort Wainwright.

Management History: Fire surveillance activities have been ongoing since Fort Wainwright was created in the 1950s. From 1980 through 2000, 148 wildfires have been reported from Fort Wainwright. Thirty-one of these fires were attributed to natural causes and 117 were attributed to human causes. Of the 117 fires resulting from human activities, 85 were attributed to military training activities. Human-caused fires and, in particular, military training-caused fires represent nearly 80% of the fire ignitions reported on Fort Wainwright. These high number of ignitions present a challenge to fire managers in terms of regular suppression and surveillance efforts. It also indicates the need for fuels mapping and hazard fuel reduction projects to lessen the chance of undesirable fires spreading to areas requiring suppression options. In 1999, a fire fuel hazard map was created for Fort Wainwright.

The average fire return interval for Fort Wainwright varies from 100 to 150 years. The majority of land burned on Fort Wainwright has been done by relatively few fires (figure 5-3).

Current Management: Fire surveillance activities remain an integral part of range operations and the fire department and will continue if this INRMP is not approved and funded. However, no new actions will be prepared, updated, or implemented.

Table 5-12. Fire Management Inventory.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Collect fuel loading information as part of the forest inventory.	USARAK Conservation	High	x	x	x	x	x
Delineate and maintain GIS data layers showing historical fires on Fort Wainwright.	USARAK Conservation	High	x	x	x	x	x
Map past areas where ordnance has been used and develop pre-suppression plans on how to deal with wildland fire suppression in these areas.	USARAK Conservation	High	x	x	x	x	x

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Map all known cultural features on suppression maps and develop fire management recommendations for these features.	USARAK Conservation	High		x			
Map all military structures on suppression maps. Assess fire suppression options and recommendations for these structures.	USARAK Conservation	High		x			
Map all known natural resources features and areas of concern from wildland fire suppression and management activities on suppression maps. Develop management strategies to avoid conflicts with these natural resource features and areas of concern.	USARAK Conservation	High			x		
Update fuels map of Fort Wainwright.	USARAK Conservation	High			x		
Update fire history map of Fort Wainwright.	USARAK Conservation	High	x	x	x	x	x
Research causes of fire ignitions on Fort Wainwright to identify areas of high fire occurrence	USARAK Conservation	High				x	
Map all known non-sensitive structures on Fort Wainwright.	USARAK Conservation	High				x	
Update fire maps with military special use areas and fire management options for these areas.	USARAK Conservation	High	x				
Research weather patterns influencing fire behavior and historical weather analysis for each land unit of Fort Wainwright.	USARAK Conservation	High	x				

Other Management Alternatives Considered and Eliminated: There are many other potential methods of conducting fire management inventory. However, proposed methods for conducting fire management inventory were developed specifically for the Alaskan ecosystems. Collecting data at many more locations per year would be cost-prohibitive.

5.3.4 Fire Management

Description and Justification: The components of fire management include both prevention and suppression. Benefits of fire suppression and fire prevention to training include reduced fuel load, an increased number of days that a facility is available during high fire season, reduced fire fighting costs, and protection of range facilities. Benefits to the environment are considerable, particularly in areas that have not burned in recent years. Fire management is required to protect, maintain, and enhance military training environments. In addition, management of the boreal ecosystem is important to maintain biodiversity, wildlife habitat, and the development of outdoor recreation. The management of fire on the

landscape is consistent with ecosystem management principles. Conducting forest management is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Management Areas: Fire management priorities are grouped into four categories: Critical, full, modified, and limited management options. Below are summaries of each category (Anonymous. 1982). Fire protection categories for north and south post are full. Fire management categories are shown in figure 5-4.

Critical Management Option: Areas receive maximum detection coverage and are highest priorities for attack response. Immediate and aggressive initial attack is provided. Land owners/managers are notified of the situation as soon as possible. Critical management areas receive priority over adjacent lands and resources in the event of escaped fires.

Full Management Option: Areas receive maximum detection coverage and receive immediate and aggressive initial attack responses. If the initial attack response is successful or the fire is otherwise controlled within the first burning period, special agency notification is not required. When fires escape initial attack and require additional suppression, affected land owners/managers are notified to develop further fire strategy.

Modified Management Option: This option provides a level of management between full and limited. The intent is to provide a relatively high degree of protection during periods of increased fire danger, but a lower level of protection when risks of fires are diminished. Modified management areas receive maximum detection coverage. Initial attack action, or non-action, is based on standardized evaluation dates as determined by the Alaska Wildfire Coordinating Group. Unmanned fires are monitored.

Limited Management Option: This option recognizes areas where natural fire is important or the values at risk do not warrant the expense of suppression. Limited management areas receive routine detection effort. Attack response is based on needs to keep the fire within limited management and to protect individual critical management areas within limited management areas. Land owners/managers are immediately notified of fires detected. Unmanned fires are monitored.

There are two other special categories on Army lands in Alaska. Unplanned areas are those lands that the land manager has opted out of the Alaska Interagency Wildland Fire Management Plan. These lands are usually treated as full management areas. Restricted or hot zone is a category used for impact areas and other places where no on-the-ground firefighting occurs. Fires can still be suppressed in restricted areas, but suppression is through backburning or aerial-dropped retardant.

Measures of Effectiveness:

- Protect structures and man-made facilities.
- Reduce the ability of potential fires to spread outside Fort Wainwright.
- Reduce forest fuel hazard through prescribed burning.
- Reduce the escape of wildland fire from impact areas through prescribed fires and mechanical treatments along the boundaries of impact areas.

Management History: AFS is developing a prescribed burning plan for the installation in conjunction with BLM and USARAK. It is currently under development by the Alaska Fire Service and was completed in 2001. A significant concern is the issue of protecting trespass structures. AFS is trying to eliminate the expense of protecting encroachment structures statewide.

Stuart Creek prescribed burn was attempted in 1996, but results were too patchy to accomplish burning objectives. USARAK will use the services of AFS to repeat this burn. The burn is a pre-attack plan and will be conducted when a wildfire starts in the area.

Current Management:

Wildfire Prevention: There are three components of wildfire prevention on Fort Wainwright. The first component is to reduce the likelihood of starting a fire by limiting activities as imposed by the Fire Danger Rating system. Reducing fuel hazard through mechanical removal and prescribed burning is the second component and constructing or maintaining fire or fuel wood breaks is the third component.

The Fire Danger Rating (FDR) is used on Fort Wainwright to reduce the risk of wildfire. The Fort Wainwright Fire Department monitors fire danger parameters, when certain levels of risk are reached, restrictions on military activities are imposed. The Fire Department collects weather readings during fire season. Data are used to calculate the FDR using the Canadian Forest Fire Danger Rating System, which is an indication of wildfire danger. The FDR is provided to Range Control, which restricts the use of munitions and pyrotechnics as fire danger increases. Open burning requires a permit, except for small warming fires (Army Environmental Handbook 2000). All fires may be prohibited during extreme fire danger conditions, check with Range Control for any restrictions.

The 1998 Range Policy, as written, categorizes fire danger into four headings, low, moderate, high and extreme. In order for the Canadian Forest Fire Danger Rating System (CFFDRS) to be applied to this type of rating scheme a certain amount of subjectivity associated with the interpretation of the indices is required as no single index gives a complete picture of the fire danger. A thorough understanding of CFFDRS is necessary for the Fire Manager to make accurate determinations.

Both prescribed burning and mechanical removal of vegetation is used to accomplish fuel hazard reduction, which, in turn, makes wildfires less likely to start and easier to control. Burning often opens areas to additional military training options, particularly maneuvers that are hampered by dense cover.

The prescribed burning window is very narrow, particularly during spring between loss of snow cover and green-up, usually occurring in May. Often this period is very wet, which makes burning difficult. It is often easier to get good burning conditions in fall, but there is debate over the relative value of fall burning. In addition, winds must be such that they do not blow smoke into urban areas, which further narrows the window. It is difficult to long-range plan prescribed burning due to weather, military training, and availability of resources. An air permit from the Alaska Department of Environmental Conservation is required for any burning as well as NEPA documentation.

Individual prescribed burns are required to have plans and appropriate NEPA documentation prepared after coordination between the BLM/NFO, the Natural Resources Branch, and the Fort Wainwright Fire Department occurs. AFS prepares the burn plans for USARAK. Burn plans are used to evaluate and minimize risks associated with prescribed burning and include how the fire will be set.

Cutting lanes specifically for fire control occurs minimally at Fort Wainwright. Major highways, waterways, wet areas, and smaller roads act as firebreaks on much of the installation. The likelihood of a fire crossing these obstructions is not cost effective enough to create and maintain additional firebreaks.

Wildfire Suppression: Wildfire suppression is an emergency operation and takes precedence over all other operations with the exception of safeguarding human life. Initial attack operations for fires started on all critical, full, and modified (before conversion to limited) lands is provided by AFS. Wildlife suppression is accomplished by BLM AFS. USARAK contributes to fire detection and is available to help as needed.

Fire suppression priorities are grouped into four categories: critical, full, modified, and limited management options.

Current fire management actions will continue if this INRMP is not approved and funded. However, no new management actions will be prepared, updated, or implemented.

Proposed Management:

Table 5-13. Fire Management Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct fire suppression activities as necessary.	BLM Alaska Fire Service (ADNR – Division of Forestry)	High	x	x	x	x	x
Identify and assess fuel management strategies for urban/wildland interface areas.	USARAK Conservation	High	x	x	x	x	x
Implement Firewise program for private landowners adjacent to military lands.	USARAK Conservation	High	x	x	x	x	x
Break up large continuous fuels in areas requiring fire suppression status.	USARAK Conservation	High	x	x	x	x	x
Develop more effective means of calculating fire weather indices for localized training areas and implement a program of relaying fire danger ratings to training units.	USARAK Conservation	High	x	x	x	x	x
Develop program of providing assistance to training military units during periods of high fire danger.	USARAK Conservation	High	x	x	x	x	x
Develop and disseminate procedures for detection and reporting of fires.	USARAK Conservation	High	x	x	x	x	x
Develop standard operation procedures for each area unit of Fort Wainwright to assist firefighters and Incident Commanders in establishing priorities, making decisions, dealing with ordnance issues.	USARAK Conservation	High	x	x	x	x	x
Develop GIS system for military fire management office and for use on incidents with current data, maps, photos, suppression options, and restrictions.	USARAK Conservation	High	x	x	x	x	x

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Identify and use fuel reduction treatments to reduce the threat of wildland fire at the urban/wildland interface, military structures, selected training areas, and cultural resources.	USARAK Conservation	High	x	x	x	x	x
Complete appropriate NEPA documentation	USARAK Conservation	High	x	x	x	x	x
Obtain appropriate air quality permits	USARAK Conservation	High	x	x	x	x	x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods for conducting fire management. However, no other options would meet the needs of the military mission. The proposed management actions listed above carefully balance the needs of the military mission, fire management, and the ecosystem. Other actions would be too minimal or would be cost-prohibitive.

5.3.5 Fire Management Responsibilities

The AFS, a BLM agency, has primary fire suppression responsibility for wildfires on lands in central and northern Alaska. The Army has an Inter-Service Support Agreement with BLM whereby AFS is provided facilities on Fort Wainwright in exchange for fire protection on Army lands.

The Fort Wainwright Fire Department is responsible for fire suppression on Main Post, and AFS has primary responsibility for the rest of Fort Wainwright. The Fort Wainwright Fire Department monitors fire danger parameters, when certain levels of risk are reached, restrictions on military activities are imposed. The Fire Department collects weather readings during fire season. Data are used to calculate Fine Fuel Moisture Content (FFMC), which is an indication of wildfire danger. The FFMC is provided to Range Control, which restricts types of munitions and pyrotechnics allowed as fire danger increases.

5.4 Fish and Wildlife Management

Fish and wildlife management on Fort Wainwright is built upon a tradition of game management to support hunting, trapping, and fishing. In the early 1980s this base broadened, driven by a growing recognition of the importance of nongame species in ecosystem functions. More recently, emphasis has been on general fauna and flora inventory. Data needed to build a nongame program as part of managing ecosystems have been or are being collected. Data collection will continue as part of program expansion.

5.4.1 Fish and Wildlife Goals and Objectives

Fish and wildlife goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Fish and wildlife goals and objectives are:

- Improve the quality of habitat for game and nongame species.
- Use artificial nesting structures to improve productivity for wildlife species.
- Ensure sustainable habitats for rare or species at risk, to avoid training restrictions.

5.4.2 Habitat Management Plan

Description and Justification: Prepare, update, and implement a habitat management plan for Fort Wainwright. The plan will describe projects to maintain biodiversity through improved habitat for moose, bear, raptors, fish, upland game birds, migratory birds and other species. The habitat management plan will maintain a diverse training environment, enhance recreational opportunities, and comply with the Sikes Act, Migratory Bird Treaty Act, Executive Order 12962, Recreational Fishery Resources Conservation Plan, Endangered Species Act, and AR 200-3. Updates of the habitat management plan are required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a habitat management plan.
- Enhance wildlife, recreation, and military ranges on Fort Wainwright.
- Involve resource agencies in planning for habitat enhancement and the public in review of the plan.

Management History: The first habitat management action plan for Fort Wainwright was completed in 2001.

Current Management: Current management actions to update the habitat management plan will cease in 2002. If this INRMP is not approved and funded, no new habitat management plan will be prepared, updated, or implemented. Policies already in place in the current habitat management plan will continue.

Proposed Management:

Table 5-14. Habitat Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct annual updates of the habitat management action plan.	USARAK Conservation	High	x	x	x	x	x
Prepare and update habitat management action plan for the planning period of 2007-2011.	USARAK CONSERVATION	High					x
Complete NEPA documentation for update	USARAK CONSERVATION	High					x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current habitat management plan in terms of updates at least every five years. NEPA documentation is also legally mandated.

5.4.3 Fish and Wildlife Inventory and Monitoring

5.4.3.1 Fish and Wildlife Monitoring

Description and Justification: Fish and wildlife monitoring on Fort Wainwright entails monitoring important and sensitive indicator species including, salmon, grayling, moose, bears, grouse, great gray owls, northern goshawks, wolves, small mammals, and neotropical migratory birds. Moose and bears are monitored to ensure harvest levels are optimal for both utilization and protection of the species. Ruffed grouse are monitored to determine habitat improvement needs and to monitor success of habitat improvement practices. Raptors are important components of the ecosystem and many are vulnerable to human impacts as evidenced by their listing as threatened or endangered either in Alaska or in other areas of the United States. There is considerable concern in North America over declining numbers of many neotropical migratory birds. The Department of Defense (DOD) is a major participant in the nationwide Partners in Flight program. Small mammals play important ecological roles as secondary consumers and as prey for a variety of predators. Conducting fish and wildlife monitoring is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Management History: Breeding bird checklists, point counts, and constant effort mist-netting stations (off-post at Creamer's Field) have been conducted to monitor avian species. Data collected from a neotropical migratory bird monitoring project on Fort Wainwright was used to augment the baseline fauna planning level survey. Trumpeter swan surveys have been conducted in TFTA. Monitoring of bear bait stations has also been a source of information about wildlife species. Hunter harvest reports were compiled through 2000 and contained much information on game species.

Measures of Effectiveness:

- Complete annual or bi-annual monitoring of fish and wildlife to support decision making and management of the ecosystem at Fort Wainwright
- Conduct monitoring to maintain an accurate database of fauna species
- Conduct cost-sharing of monitoring utilizing partnerships with the Alaska Department of Fish and Game (ADF&G), USFWS, and BLM

Current Management: Fish and wildlife monitoring includes annual or periodic checks to evaluate trends in populations. Breeding Bird Surveys (BBS) and Measuring Avian Productivity and Survival (MAPS) stations are used to monitor avian species. Hunter surveys are used to collect data on game species. Aerial monitoring is also used to evaluate populations of large species. Fish monitoring is conducted through user success surveys and stream and lake surveys.

Current inventory and monitoring actions will continue if this INRMP is not approved and funded. However, no new actions will be prepared, updated, or implemented.

Proposed Management:

Table 5-15. Fish and Wildlife Monitoring.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct nongame monitoring every five years.	USARAK Conservation	High		x			

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct furbearer monitoring every five years	USARAK Conservation	High				x	
Conduct swan surveys on Fort Wainwright.	USARAK Conservation	High	x	x	x	x	x
Conduct raptor monitoring every five years.	USARAK Conservation	High			x		
Conduct moose monitoring annually.	USARAK Conservation	High	x	x	x	x	x
Conduct grouse monitoring every five years.	USARAK Conservation	High			x		
USARAK will, in coordination with ADF&G, conduct a one to two year monitoring program of Fort Wainwright lakes.	USARAK Conservation	High		x	x		
Conduct BBS annually.	USARAK Conservation	High	x	x	x	x	x
Annually monitor neotropical birds using, MAPS stations.	USARAK Conservation	High	x	x	x	x	x
Continue black bear data collection and monitoring.	USARAK Conservation	High	x	x	x	x	x
During 2002-2006, update the bird checklist.	USARAK Conservation	High		x			
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods of conducting fish and wildlife monitoring. However, proposed methods for conducting fish and wildlife monitoring and inventory were developed specifically for the Alaskan ecosystems. Other methods could be developed that include collecting data at many more points per year or studying other species, but these would be cost-prohibitive and are not consistent with USARAK wildlife management goals.

5.4.3.2 Fauna Planning Level Survey

Description and Justification: Conduct fauna planning level surveys of birds, fish and mammals on Fort Wainwright. These planning level surveys focus on neotropical, waterfowl, and raptor avian species, salmon, grayling, and other fish species, and small mammal species. This project is a 10 year update to determine trends in faunal biodiversity and improve the quality of the faunal database. An accurate fauna planning level surveys is required by AR 200-3 and is required to implement this INRMP as mandated by Public Law 86-797 (Sikes Act). Per Memorandum DAIM-ED-N, 21 March 1997, this planning level survey is a class 1 requirement.

Measures of Effectiveness:

- Complete, maintain, and update a fauna planning level survey on Fort Wainwright.
- Complete, maintain, and update a planning level survey for threatened, endangered, or species of concern on Fort Wainwright.

- Identify the requirement for a fauna planning level survey in the EPR.
- Identify the requirement for planning level survey for threatened and endangered species fauna in the EPR.

Management History: In 1998 active and inactive raptor nest structures were identified and qualitatively assessed along cliffs and riparian areas (Anderson et al. 2000). This survey evaluated areas on TFTA and YTA, particularly on the Salcha and Tanana rivers. A pre-leaf-out (mid-May) aerial survey was used to identify and map large stick nests (bald eagles) as well as incidental nest sites for other tree-nesting species. An early to mid-incubation period survey (late May-early June) was used to identify large stick nest platforms (golden eagles and peregrines) and/or occupancy of cliff sites by raptors. In addition, cliffs were evaluated for their potential use by nesting raptors. Raptor nest sites and habitat data were digitized into ArcInfo GIS databases. Significant sites (nest locations, cliff areas) were classified to habitat types based on ecological land survey maps.

Landbirds

The Alaska Bird Observatory (Benson 1999) collected basic information on the distribution of landbirds in various habitat types using the Ecological Land Classification for the YTA and TFTA. Some habitats were selected or avoided by landbirds. Other landbirds were generalist, found over a variety of habitats on Fort Wainwright.

A recent small mammal studies by ABO (Anderson et al. 2000, Jorgenson et al. 2000) included small mammal trapping in mid- to late summer 1998 with additional trapping targeted at rare species in 1999. This study developed a list of mammal species that occur on the YTA, identified small mammal ecotype associations of use in ecological land evaluations of military lands in interior Alaska, documented the occurrence of rare or poorly known mammals if possible, and assessed wildlife habitat associations for use in ecological land evaluations.

Current Management: There are currently no on going actions updating the fauna planning level survey.

Proposed Management:

Table 5-16. Fauna Planning Level Survey.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Update the fauna planning level survey.	USARAK Conservation	High			x		

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current fauna planning level survey. Per the Sikes Act, AR 200-3, and Memorandum DAIM-ED-N, 21 March 1997, this planning level survey must be updated every 10 years.

5.4.4 Fish and Wildlife Management

Fish and wildlife population management is accomplished through actions directly affecting fish and wildlife species. Setting population number goals and stocking game species are the primary actions used to manipulate populations directly. Habitat management affects fish and wildlife populations indirectly by manipulating their habitat.

5.4.4.1 Fish and Wildlife Population Management

Description and Justification: Conduct fish and wildlife management on Fort Wainwright. Fish and wildlife management includes working with Alaska Department of Fish and Game to stock fish in lakes; control nuisance animals; conduct management of important and sensitive indicator species including nongame mammal species, furbearers, waterfowl and waterbirds, raptor and other avian predators, neotropical, migratory and other avian species, moose, grouse, wolf, and fish. Conducting fish and wildlife population management is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- Maintain sustainable numbers of all species on Fort Wainwright.
- Preserve and enhance biodiversity.
- Provide an adequate fishery on Fort Wainwright through annual fish stocking.

Management Areas: Management emphasis areas on Fort Wainwright for fisheries management are shown in figure 5-5. Game Management Units are shown in figure 5-6.

Management History:

Furbearers: Trappers on Fort Wainwright are required to register their traplines. These trappers are expected to submit annual harvest reports. Furbearers have been monitored using trapping harvest reports. Wolf harvest data is included in the harvest report.

Waterbirds: Waterbird surveys were conducted in the YTA in 1998 (Anderson et al. 2000). The many wetland complexes, ponds, and lakes provide a variety of foraging and staging habitats for waterfowl during the fall migration. There is widespread use of these areas by waterbirds, where timing and pattern of use are similar to other Alaskan areas.

Trumpeter swan surveys have been conducted semi-annually on the Tanana Flats since 1978, with the exception of 1991, as part of a continent-wide monitoring program. Nesting surveys for trumpeter swans were flown in the YTA in 1998. No nesting swans were seen.

Grouse: Ruffed and spruce grouse are the most harvested small game species on Fort Wainwright. Increased surveying is necessary to improve management for ruffed grouse. Little is documented regarding the distribution and relative population size of ptarmigan on the post.

Bear: Grizzly bear harvest has not exceeded three bears annually during the past five years on Fort Wainwright. There is no requirement by ADF&G to monitor grizzly bears beyond collecting harvest results.

Hunter pressure for black bear is significantly higher in YTA than TFTA (Hechtel. 1991). Hechtel studied black bears on Fort Wainwright from 1988 through 1991, concentrating on TFTA. Overall harvest was judged to be sustainable, although areas like YTA may have localized overharvest due to easier access. There is little information on the YTA component of the Unit 20 black bear population.

Moose: ADF&G started moose population surveys and habitat quality surveys during the fall of 2000 on Fort Wainwright. The Military Police Game Wardens set up check stations each September during 1993-1996 to monitor moose harvest on Fort Wainwright and Eielson AFB. Check stations were also established in the YTA. Check stations were used to monitor hunter use and harvest, and serve as base

camps for enforcement patrols, centers for emergency assistance, and information centers. Harvest information was provided to ADF&G to supplement their data collection efforts.

Caribou: The *Fortymile Caribou Herd Management Plan* (Anonymous. 1995b) was developed to recover the herd, primarily for three reasons:

- Restore ecosystem biodiversity.
- Provide opportunities for people to once again observe thousands of caribou crossing the Taylor, Steese, and Top of the World highways.
- Restore the traditional subsistence resources of this area.

The Delta/MaComb and Fortymile caribou herds have used areas of Fort Wainwright in the past. Currently the range of the herds may skirt the edges of post, but the numbers of animals on post do not provide any hunting opportunities.

Fish Stocking: ADF&G, Fairbanks office, stocks Fort Wainwright through the Statewide Stocking Plan (Alaska Department of Fish and Game. 2001). ADF&G stocks River Road Pond (formerly called Wainwright #6 or Sage Hill Pond) and Monterey Pond every year, and Manchu Lake on alternate years and Weigh Stations #1 and #2 ponds, just west of the highway near Badger Road annually.

Duck Pond was formerly stocked with catchable rainbow trout, but this has been discontinued due to access restrictions to protect a USARAK cross-country trail. ADF&G has test netted Horseshoe Lake in the YTA for pike, and have found no fish. Northern pike may migrate into the lake during high water years from the various drainages in the area.

Table 5-17. Fish Stocking on Fort Wainwright.

Location	Species	Size	1998	1999	2000	2001	2002
Manchu Lake	Arctic Char	Fingerling	0	8,600	0	8,600	0
	Rainbow Trout	Fingerling	0	8,600	0	8,600	0
River Road Pond	Grayling	Catchable	300	300	300	300	300
Monterey Pond	Rainbow Trout	Catchable	500*	2,000	2,000	2,000	2,000

Current Management: Hunting, fishing, and trapping on Fort Wainwright are conducted under regulations promulgated by the ADF&G to ensure that population numbers can be supported by the available habitat as well as being able to sustain meeting the recreational hunting demand. USARAK collects data on the harvest of game and furbearers on the post and provides these data to the ADF&G to assist the agency in promulgating harvest regulations. USARAK manages hunting, trapping, and fishing on Fort Wainwright in terms of areas available, dates within ADF&G seasons, safety requirements, permit and reporting requirements, and other parameters to avoid conflicts with the military mission and provide safe, high quality recreational experiences.

Hunting, Trapping, Fishing Harvest Management: Data are collected using annual hunter and trapper harvest reports and check stations. The system requires close coordination between the Law Enforcement Command and Natural Resources Branch.

USARAK has evaluated the hunting, trapping, and fishing management program for more effective ways to collect data. This project is incorporated into the outdoor recreation plan produced in 2001.

Current wildlife population management actions will continue if this INRMP is not approved and funded. However, no new management actions will be prepared, updated, or implemented.

Proposed Management:

Table 5-18. Fish and Wildlife Population Management.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Support ADF&G wildlife population control by allowing hunting and trapping on post	USARAK Conservation	High	x	x	x	x	x
Annually stock lakes on Fort Wainwright	ADF&G	High	x	x	x	x	x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods for conducting fish and wildlife population management. However, no other options would meet the needs of the military mission. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost-prohibitive.

5.4.4.2 Habitat Improvement

Description and Justification: Habitat management includes development and improvement of habitat for moose, brown and black bear, wolverine, lynx, coyote, fox and other smaller mammals and birds, including bald eagles, owls, hawks, and a variety of waterfowl and passerines currently inhabiting the installation. USARAK, ADF&G, USFWS and BLM are responsible for habitat management on Fort Wainwright. Conducting habitat improvement is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Habitat Management Areas: Habitat management areas have been created to show the likelihood of habitat manipulation in any given area. These areas are shown in figure 5-7.

Table 5-19. Habitat Management Areas.

Management Areas	Habitat Action	Habitat Type Desired	Size
Habitat management areas	Reduce forest density and forest understory.	Medium forest canopy with open understory	300,000 acres
	Reduce scrub vegetation on a rotational basis.	Primary successional habitat with low to no forest canopy and high density shrub layer	200,000 acres

	Eliminate all woody vegetation on a permanent basis. Maintain herbaceous and grass ground cover.	Open	10,000 acres
	Increase woody vegetative cover through wildlife improvement plantings.	Shrubland to open forest	1,000 acres
Habitat protection areas	No habitat management or other vegetation manipulation.	Protect habitat as it naturally occurs	400,000 acres
Non-Habitat Areas	None	N/A	50,000 acres

Management History: In 1995 AFS cut approximately 25 acres of mature aspen in 12 patches in an area beside Quarry Road near the intersection of Manchu Road in the YTA. This project became part of the Grouse Habitat Improvement program beginning in 1998.

Volunteers constructed 10 nest boxes for ducks in 1996. About 20 boreal owl nest boxes exist on birch trees on Birch Hill from a 1994 Eagle Scout project. Each nest box location will be added to the GIS database and maintained annually.

The 1996 prescribed burn within Stuart Creek Impact Area in the YTA was very spotty, and less than 30% of the area burned. This tends to create a good mosaic of conditions for wildlife, but it did not meet the objective of clearing the area for targetry work by the Air Force.

Measures of Effectiveness:

- Improve the quality of habitat for game and nongame species.
- Emphasize habitat development and enhancement for moose, an important game and watchable wildlife species on Fort Wainwright.
- Manage game habitats to support sustainable hunting and fishing programs.
- Maintain a minimum of 200,000 acres of preferred moose habitat.
- Maintain a minimum of 700,000 acres of neotropical bird habitat.
- Maintain a minimum of 250,000 acres of waterbird habitat.

Current Management: USARAK utilizes two primary methods of manipulating habitat: prescribed burning and mechanical removal of vegetation. USARAK also utilizes herbaceous and woody vegetation plantings in the cantonment area to improve habitat.

Prescribed Burning: Prescribed burning is beneficial to ecosystem maintenance on much of Fort Wainwright because fire is an important component of the ecosystem's development. Prescribed burning is also favored by BLM. It is less complicated and a more natural means of vegetation removal than using timber harvest or other mechanical means.

Mechanical Removal and Revegetation: Mechanical means of habitat manipulation is another way to accomplish habitat management. Mechanical tools used to accomplish habitat management include commercial timber sales, timber stand improvement, firewood cutting, hydro-axe and military maneuver training. Habitat improvement areas are then planted with desired herbaceous species or left to revegetate naturally.

Wildlife Habitat Improvement Plantings: This component of habitat improvement includes management of the cantonment area that directly affects natural resources management. Routine ground maintenance on Fort Wainwright is accomplished primarily by Grounds Maintenance, DPW. The *Installation Design Guide* (Higginbotham / Briggs & Associates. 1991) and the *Landscape Design Plan* (David Evans and Associates, Inc. 1987) provide information on using trees and shrubs for landscaping. Both documents provide lists of plant materials appropriate for use on Fort Wainwright.

This INRMP does not include routine ground maintenance unless it is specifically designed for the benefit of natural resources. Natural resources personnel provide professional assistance for landscaping, particularly regarding species selection and care of the landscape.

Current habitat improvement actions will continue if this INRMP is not approved and funded. However, no new habitat improvement actions will be prepared, updated, or implemented.

Proposed Management:

Table 5-20. Habitat Management.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct wildlife planting in urban areas.	USARAK Conservation	High	x	x	x	x	x
Improve and enhance moose habitat.	USARAK Conservation	High	149.7 acres	121.1 acres	129 acres	118.6 acres	115.4 acres
Enhance up to 200 acres annually of military training habitat.	USARAK Conservation	High	x	x	x	x	x
Enhance up to 30 acres per year of ruffed grouse habitat.	USARAK Conservation	High	x	x	x	x	x
Control bluejoint grass on an opportunistic basis .	USARAK Conservation	High	x	x	x	x	x
Block vehicular access, including off-road vehicles, to riparian areas along lakes.	USARAK Conservation	High				x	
Improve habitat by closing and revegetating unnecessary trails.	USARAK Conservation	High	x	x	x	x	x
Construct boreal owl (<i>Aegolius funereus</i>) nest boxes.	USARAK Conservation	High	x	x	x	x	x
Determine the need for stream and lake habitat improvement.	USARAK Conservation	High	x	x	x	x	x
Adjust construction and maintenance practices involving rights-of-way on Fort Wainwright to improve wildlife habitat.	USARAK Conservation	High	x	x	x	x	x

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Provide for ADF&G review of all actions possible affecting streambanks	USARAK Conservation	High	x	x	x	x	x
Complete NEPA documentation	USARAK Conservation	High	x	x	x	x	x
Evaluate the relationship between moose numbers and habitat carrying capacity and identify areas where habitat improvement is most needed.	USARAK Conservation	High		x			
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods for conducting habitat management. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost-prohibitive.

5.4.5 Fish and Wildlife Management Responsibilities

ADF&G has the primary responsibility for managing fish and wildlife game populations. ADF&G sets population goals and carries out stocking on Fort Wainwright. USFWS is primarily responsible for managing nongame populations of fish and wildlife. USARAK is responsible for working together with these two agencies to conduct habitat management on Fort Wainwright. Routine grounds maintenance on Fort Wainwright is the responsibility of Roads and Grounds Maintenance, DPW

5.5 Endangered Species Management

There are no known federally endangered or threatened species on Fort Wainwright, but there are a number of rare, uncommon, or priority species. The endangered species management program at Fort Wainwright deals primarily with these rare, uncommon, and priority species.

The endangered species program is integrated fully with other natural resources programs, especially ecosystem management. Because there are no federally-listed endangered or threatened species on Fort Wainwright, all actions that protect, conserve, and enhance rare, uncommon, and priority species and their habitats are listed under other program areas.

5.5.1 Endangered Species Management Goals and Objectives

Endangered species management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Endangered species management goals and objectives are listed:

- Protect and conserve endangered, threatened, rare, uncommon and priority species on Fort Wainwright.
- Identify and delineate endangered species and their habitats on Fort Wainwright.

- Conduct appropriate Section 7, Endangered Species Act consultation for any actions that may impact endangered species.

5.5.2 Endangered Species Planning

Endangered, threatened, or rare species program management includes all planning, budgeting, organizing, and overseeing contracts necessary to implement the endangered species program. The primary emphasis for this component of the endangered species management program is to ensure that rare, uncommon or priority species are included in the ecosystem management plan. There will be no endangered species management plan for Fort Wainwright unless a federally-listed endangered or threatened species is found on the installation.

5.5.3 Endangered Species Inventory and Monitoring

Endangered species inventory and monitoring is accomplished through other program surveys. One of the objectives for flora and fauna planning level surveys was to identify any endangered or threatened species. LCTA monitoring continues to look for any potential threatened or endangered species as vegetation is monitored. Avian monitoring, including breeding bird surveys, continues to look for threatened or endangered species. Rare, uncommon, or priority species found on Fort Wainwright are identified and delineated through these planning level survey and monitoring efforts.

5.5.4 Endangered Species Management

Description and Justification: Endangered species management involves protecting, conserving, and enhancing habitat for rare, uncommon, or priority species. There are no known federally endangered or threatened species on Fort Wainwright, but there are a number of rare, uncommon, or priority species. Endangered, threatened and rare species management on Fort Wainwright entails monitoring and protection of sensitive habitat for avian, mammal, and plant species. Conducting endangered and threatened species management is required by the Endangered Species Act, Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- Protect all threatened and endangered species on Fort Wainwright.
- Monitor annually to locate any threatened or endangered species on Fort Wainwright.
- No jeopardy opinions for threatened or endangered species.
- Conserve habitat for rare, sensitive, uncommon, and priority species on Fort Wainwright.
- Maintain a designated natural resources professional with appropriate training on Fort Wainwright.

Management History: The 1997-initiated survey for threatened or endangered species was completed in 1998. Survey data have been stored digitally in the USARAK GIS. Updated surveys will be required in 2006.

Current Management: Current management for endangered species is limited to continuing the ongoing search to locate any potential endangered or threatened species as part of other avian and mammal surveys. There are no plans to conduct additional surveys for threatened or endangered species during 2002-2006. If new species are listed, or there is reason to believe that listed species might be on Fort

Wainwright, USARAK will survey for them. If this INRMP is not approved and funded. However, no new habitat improvement actions will be implemented.

Proposed Management:

Table 5-21. Endangered Species Management.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Take appropriate steps to survey for threatened and endangered species if new species are listed or there is reason to believe that already listed species might be on Fort Wainwright.	USARAK Conservation	High	x	x	x	x	x
Conserve habitat for rare, uncommon, and priority species through the ecosystem management actions listed under habitat management and fish and wildlife management.	USARAK Conservation	High	x	x	x	x	x
Comply with USFWS protocols for TES if located on Fort Wainwright	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are no other options to endangered species management. If an endangered species is located on Fort Wainwright, USARAK is legally mandated to take appropriate steps to survey and protect that species. Eliminating all survey actions would be too minimal or surveying the entire installation would be cost-prohibitive. Current survey actions provide the most cost-effective means to determine if endangered species are present.

5.5.5 Endangered Species Program Responsibilities

USFWS is responsible for administering the Endangered Species Act. USARAK is responsible for continuing to identify and delineate any species that are listed as threatened or endangered. USARAK is responsible for conducting Section 7 consultation with USFWS for any actions that may affect endangered or threatened species.

5.6 Special Interest Area Management

Designation of special protection status for important or fragile natural areas is an effective management tool. In accordance with AR 200-3, areas that contain natural resources that warrant special conservation efforts will be identified during the inventory and classification process. After appropriate study and coordination, such areas may be managed as special interest areas for their unique features. Per AR 200-3, this INRMP “*will address the special management necessary for these areas, and all current and future land uses will consider the uniqueness of these areas and plan accordingly to ensure conservation of their resources.*”

5.6.1 Special Interest Area Goals and Objectives

Special interest area management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Special interest area management goals and objectives are:

- Identify and provide protection for areas of special ecological or cultural concern.

5.6.2 Special Interest Area Management Plan

Description and Justification: Prepare, update, and implement a special interest area management action plan for Fort Wainwright. The special interest area management action plan identifies, delineates, and proposes measures to protect and conserve special interest areas on Fort Wainwright. Updates of the special interest area management plan are required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a special interest area management plan.
- Decrease disturbance to special interest areas on Fort Wainwright.
- Involve resource agencies in planning for special interest areas and provide an opportunity for the public to review the plan.

Management History: The first special interest area management and action plan for Fort Wainwright was completed in 2001.

Current Management: Current management actions to update the special interest area management plan will cease in 2002. If this INRMP is not approved and funded, no new special interest area management plan will be prepared, updated, or implemented. Policies already in place in the current special interest area management plan will continue.

Proposed Management:

Table 5-22. Special Interest Area Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct annual updates of the special interest area management action plan.	USARAK Conservation	High	x	x	x	x	x
Prepare and update special interest area management action plan for the planning period of 2007-2011.	USARAK Conservation	High					x
Complete NEPA documentation for update.	USARAK Conservation	High					x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current special interest areas management plan in terms of updates at least every five years. NEPA documentation is also legally mandated.

5.6.3 Special Interest Area Inventory and Monitoring

Inventory of special interest areas is conducted to identify, locate, delineate and map areas of unique or sensitive status. Annual monitoring is accomplished through other programs, such as LCTA, aerial monitoring, and fish and wildlife monitoring.

5.6.4 Special Interest Area Management

Description and Justification: Manage special interest areas on Fort Wainwright. Special interest areas on Fort Wainwright include water body protective areas, remnant vegetation areas, wildlife viewing areas, and moist tundra areas. Special interest areas will be individually managed according to their specific needs. Designation of special protection status for sensitive or fragile areas is an important management tool. It is often easier and more cost effective to place use restrictions on some areas to minimize damage or disturbance than to repair damage or disturbance after it has occurred. Conducting special interest area management is required as mitigation for the five year Section 404 Clean Water Act wetland permit for military training, by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS, and Public Law 86-797 (Sikes Act) to implement the INRMP.

Management Areas: Management areas are Sage Hill Special Interest Area, Granite Tors Special Interest Areas, Wood River and Clear Creek Buttes, Moose Calving Areas on Tanana Flats, and Moist Tundra Special Interest Areas. These areas are described in greater detail in Section 2.3.4.

Measures of Effectiveness:

- Reduce impacts around water bodies and in moist tundra areas.
- Reduce the impact of training and recreation activities to special interest areas.

Management History: Special interest areas have been protected since 1998 on the environmental limitations overlays, thus reducing the impact on these areas from military activities.

The Granite Tors rock outcrops along the eastern portion of YTA likely have cultural significance. USARAK has imposed restrictions on development, ground disturbance, and vegetation removal in the Granite Tors to protect any cultural resources.

Buttes near Blair Lakes and along the Wood River have cultural and ecological significance. Many of these buttes have cleared helicopter pads for military training, since they are on high, relatively dry ground. These buttes will be placed off-limits to ground and vegetation-disturbing activities with exception of existing helicopter pads. This restriction should not impact military training since most missions on the buttes require vegetative cover for concealment.

ADF&G have identified six parcels on TFTA as important moose calving areas from 15 May through 30 June annually. The Army has agreed with ADF&G (U.S. Army. 1986) to conduct operations in such a manner that will not adversely affect calving in these parcels between 15 May to 30 June. Since nominal training occurs on TFTA during warm months, this has not impacted military training on Fort Wainwright.

Moist tundra is one of the most easily damaged ecosystems on Fort Wainwright, especially during warm weather on Fort Wainwright. Moist tundra occurs above treeline on tops of hills, 2,500-3,000 feet above sea level. The Army provides protection for fragile moist tundra by requiring it be frozen prior to military training. In addition, a six-inch layer of snow is required to be left on the ground when creating winter trails for military access rather than plowing to bare ground. This prevents damage to the protective vegetation mat.

Current Management: Special interest area management includes protecting special interest areas through regulations, overlays, and barriers. USARAK Regulation 350-2, *Range Regulation*, has many general provisions to protect environmental resources, including special interest areas, on Fort Wainwright. The provisions include:

- NEPA review of actions affecting natural resources.
- Restoration of sites damaged by digging.
- Removal of wire, rope, string, concertina wire, and other training debris.
- Wildfire prevention measures.
- Preference for use of established roads and trails.
- Stream crossing requirements to include coordination with ADF&G.
- Protection of trees with diameters greater than four inches.
- Prohibitions on harassment of wildlife.
- Spill prevention and containment measures.
- Hazardous materials handling procedures.
- Coordination of ground-disturbing activities with the Conservation Branch
- Controls on outdoor recreation including swimming, hunting, fishing, and firewood cutting.

Military mission-related restrictions within special interest areas are included in the environmental limitations overlays and EA materials prepared for distribution to military units that use training areas on Fort Wainwright. Most military mission-related restrictions involving special interest areas have been in place for some time, with no adverse impacts on accomplishment of the mission.

Physical barriers can be used to protect special interest areas. However, this is only used in extreme cases because barriers tend to draw attention to an area.

Current special interest area protection actions will continue if this INRMP is not approved and funded. However, no new actions will be prepared, updated, or implemented.

Proposed Management:

Table 5-23. Special Interest Area Management.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Manage and protect Sage Hill Remnant Vegetation Area.	USARAK Conservation	High	x	x	x	x	x
Manage and protect Granite Tors special interest area.	USARAK Conservation	High	x	x	x	x	x
Manage and protect alpine tundra areas.	USARAK Conservation	High	x	x	x	x	x
Manage and protect cultural resources areas.	USARAK Conservation	High	x	x	x	x	x

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Manage and protect Wood River and Clear Creek Buttes special interest areas.	USARAK Conservation	High	x	x	x	x	x
Manage and protect moose calving areas on TFTA.	USARAK Conservation	High	x	x	x	x	x
Manage and protect other riparian areas, lakes, and wetlands.	USARAK Conservation	High	x	x	x	x	x
Manage and protect other riparian areas, lakes, and wetlands	USARAK Conservation	High	x	x	x	x	x
Complete NEPA documentation when necessary	USARAK Conservation	High	x	x	x	x	x
Produce annual report of project status	USARAK Conservation	High	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many other potential methods for conducting special interest areas management. However, no other options would meet the needs of the military mission. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost-prohibitive.

5.6.5 Special Interest Area Responsibilities

USARAK has primary responsibility for management of special interest areas. Within USARAK, DPW EA has responsibility to identify, locate, monitor and manage special interest areas. DPTSM Range Control provides control over access into these areas.

5.7 Pest Management

5.7.1 Pest Management Goals and Objectives

Pest management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Pest management goals and objectives are:

- Meet requirements defined by the Army pest management program measures of merit.
- Use alternative strategies (sanitation, trapping, biological control, mechanical control, etc.).
- Select the least toxic pesticides.
- Select precision application techniques that target specific pests and habitats.
- Emphasize education, communication, monitoring, inspection, and record keeping.

5.7.2 Pest Management Plan

Description and Justification: Maintain and update the Installation Pest Management Plan (IPMP). Fort Wainwright updated its IPMP in 1996. The goal of the IPMP is to minimize the adverse environmental impacts of using pesticides while achieving an acceptable level of control and cost-effectiveness. Completion and updates of the plan are required to meet US Army Pacific (USARPAC) pest management measures of merit. This plan discusses specific actions necessary to accomplish pest management on Fort Wainwright. Pest management planning is a requirement of AR200-5. Updates of the pest management plan are required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, maintain, and update a pest management plan for Fort Wainwright.
- Meet the pest management measures of merit through pest management planning.
- Designate a qualified/trained pest management coordinator.
- Continue to reduce pesticide use.
- Involve resource agencies in planning for pest management and the public in review of the plan.

Management History: The Fort Wainwright pest management plan was first completed by the USACE in 2000.

Current Management: Current management actions to update the installation pest management plan will cease in 2002. If this INRMP is not approved and funded, no new pest management plan will be prepared, updated, or implemented. Policies already in place in the current pest management plan will continue.

Proposed Management:

Table 5-23. Installation Pest Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct annual updates of the installation pest management action plan.	USARAK Conservation	High	x	x	x	x	x
Prepare and update installation pest management action plan for the planning period of 2007-2011.	USARAK Conservation	High					x
Complete NEPA documentation for update.	USARAK Conservation	High					x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current Installation Pest Management Plan in terms of updates at least every five years. NEPA documentation is also legally mandated.

5.7.3 Pest Management Inventory and Monitoring

Pest management inventory and monitoring is accomplished by surveillance surveys by pest control personnel. Other natural resources monitoring efforts also contribute to pest management monitoring. LCTA, in particular, monitors vegetation annually and identifies invasive and exotic plant species in the training areas.

5.7.4 Pest Management

Measures of Merit: In 1994, the Department of Defense developed a Measures of Merit Program for all military installations, which requires a pest management plan to be prepared, signed, and implemented. Other requirements include the reduction of pesticide use on all installations by 50% over a seven year period (1994–2000) and certified training of all pest control personnel.

Installation Pest Management Plan: Fort Wainwright completed and approved a Pest Management Plan in 1996. Reduction in pesticide usage on Alaskan installations is being closely coordinated with USARPAC. All Alaskan Army pest control personnel are in compliance with the basic training certification required by Measures of Merit.

Chemical Use: All chemicals used on Fort Wainwright are Environmental Protection Agency (EPA)-approved. Pesticide use on Fort Wainwright has fallen dramatically over the last two years. Significant decreases in the number of soldiers based on the post have contributed to that reduction. Remodeling and new construction have also helped reduce the volume of pesticides used since these buildings are more pest resistant and new construction usually has fewer pest problems.

Reducing chemical use is a major goal of the pest management program. Installation personnel understand both immediate and long-term threats to humans and ecosystem functions from chemical abuses. The pest management program emphasizes careful evaluation before chemicals are applied. More efficient equipment and techniques allow the reductions in the volumes and toxicity of chemicals used.

The most difficult objective for Fort Wainwright is the reduction of herbicides. In general, the acreage of improved grounds has not been reduced enough to allow for a 50% reduction in herbicides without changing the appearance of the post. Reduced grounds maintenance has eliminated about 1/8th of improved grounds since 1993, but significant future reductions are unlikely. Dandelion (an exotic species) control is especially difficult to achieve if herbicide reduction objectives are implemented.

Pesticide Certification: Provide refresher training for Pest Control personnel certified for pesticide handling. Certification and maintenance of that certification for Pest Control personnel at Fort Wainwright are required to meet USARPAC pest management Measures of Merit. USARAK has the option to use a combined Army, Navy, and Air Force pesticide training facility in Hawaii or the Army school at Fort Sam Houston in Texas.

Invasive and Exotic Plant Control: At Fort Wainwright, vegetation control is required on the airfield, shoulders of main roads, storage areas, and in pavement cracks. Weeds such as dandelions, knotweed, crabgrass, etc. are treated when requested on a service or work order (Lassek. 1996). Chemical control is a last resort option. Lawn weeds are treated with 2-4D. Roundup® is used on weeds growing in pavement cracks.

Soil sterilants are used in areas where bare ground is required, such as the industrial portion of the post and the POL point. Bromacil® is used for this purpose. Any plant control activities associated with withdrawn lands will consider the BLM strategic noxious weed control plan.

Pest Animal Control: Pests must be controlled for a variety of reasons, including human health, protection of property and foodstuffs, protection of desired vegetation, safety, and general quality of life.

Domestic Pets. Stray cats and dogs generally are the responsibility of road patrol personnel of the Provost Marshal. Neither road units nor game wardens with the Military Police have access to tranquilizer guns, so slip nooses are generally used to capture animals. Captured animals are taken to the Fort Wainwright veterinarian.

Household and Nuisance Pests. Pest Control handles household pests on Fort Wainwright. An integrated approach is used to control pests, including education, sanitation, and, as a last resort, chemical control. Rodents such as shrews, voles, and lemmings are controlled by using sticky traps or bait (Lassek. 1996).

Undesirable Fish. Five lakes on Fort Wainwright are stocked by ADF&G. At this time they are not known to contain any species of undesirable fish.

Road-killed Moose. Military Police game wardens are called to handle road-killed moose. If carcasses are still safe for human consumption, they are donated, using a charity list.

Birds (except BASH). Cliff swallows may build nests under eaves of buildings, including residences, creating a nuisance and health concern. Droppings are unsightly and are a growth medium for a fungi that causes a respiratory infection (histoplasmosis). Swallows also are infested with mites. Exclusion from nesting sites is the preferred means for controlling cliff swallows. Sometimes it is necessary to destroy nests, which may include eggs or young.

Fort Wainwright personnel conduct such nest destruction only under a depredation permit from USFWS, which is obtained annually. Detection and action early in the breeding season will avoid destruction of nests with young or eggs. The Fire Department is sometimes called upon to wash out nests in places difficult to reach, such as in the aircraft hangar. Swallow problems have significantly decreased in recent years.

There are numerous ways to deal with pigeon problems, depending on location. Each case is evaluated individually and appropriate action is taken. In general, screening is the preferred method to keep pigeons from hangers. However, in 1995 it was necessary to trap pigeons, with 287 being captured.

All actions are performed in accordance with the Migratory Bird Treaty Act which prohibits the taking, killing, or possession of migratory birds.

Ornamental and Tree Pests. Scale insects, aphids, and other pests of trees and ornamentals are seldom a problem on Fort Wainwright. Use of insect-resistant trees and ornamentals, and proper care of trees, including watering, pruning, and fertilization, minimize outbreaks (Lassek. 1996).

Real Property and Stored Product Pests. Real property pests include carpenter ants and decay fungi. Neither is a major concern at Fort Wainwright. Control is conducted on an as-needed basis. Veterinary personnel at MEDDAC inspect for pests in stored products except in Housing, which is the Pest Controller's responsibility. The two most common pests of stored products are the sawtooth grain beetle (*Oryzaephilus surinamensis*) and the confused flour beetle (*Tribolium confusum*). Infestations are controlled by DPW, generally through destruction of the product, followed by application of a residual insecticide (Lassek. 1996).

Disease Vectors. Mosquitoes, biting gnats, and flies are serious pests during warm months. The Alaska Preventative Medicine Branch, MEDDAC and the Pest Controller are responsible for monitoring

mosquitoes and determining if they need to be controlled. Control is the responsibility of DPW and includes elimination of mosquito breeding areas and use of pesticides when needed. Ultra low volume insecticide treatment of *Pyrenone* is recommended. Flies normally are treated using sanitation practices.

Predator Control. Control of wolf populations on military lands in Alaska is prohibited. Any predator control on Fort Wainwright must be approved by USARAK and evaluated through the NEPA process.

Other Animals. Pest Control handles most other animal problems. Each problem is evaluated individually. Bear problems usually require assistance from ADF&G, although MP game wardens have first-response responsibility. Wardens occasionally chase moose from housing areas.

Bird-Aircraft Strike Hazard Management: The BASH program will develop ways of reducing the air strike hazard by manipulating habitat to decrease the number of birds near the runway. The role of the Natural Resources Branch is to provide technical expertise and make recommendations to Public Works, USARAK Aviation Safety, Airfield Operations, and the Pest Control Branch to reduce bird use of critical areas. The BASH program includes the following features:

- Continue depredation of key nuisance species with depredation permit to be renewed annually. The pest management program will place wire on hangers where swallows and pigeons are roosting or nesting.
- Produce education materials for BASH, including videos, posters, handouts, training, bird books.
- Attend Post BASH team meetings: Fort Wainwright and Fort Richardson each have their own BASH team, which try to meet at least once in the spring and fall.
- Ensure that Public Works, the Fire Department, and AFS all work together to keep birds off the airfields.

5.7.5 Pest Management Program Responsibilities

Pest management is the responsibility of DPW, specifically a certified pest controller. Other organizations involved include Provost Marshals Office (PMO) game wardens and DPW Environmental Resources. The Pest Management Coordinator for USARAK is within Conservation Branch, DPW, Fort Wainwright. He is not involved in routine pest management operations, but serves as a technical advisor to the program.

Noxious animal control responsibility is shared at Fort Wainwright. In general, Pest Control Branch, DPW, and the PMO work within the cantonment area. The PMO, assisted by ADF&G and the Alaska State Troopers, handles problems with game animals. Animal Damage Control (ADC), U.S. Department of Agriculture, has skills that may be useful in controlling noxious animals.

Figure 5-1. Environmental Limitations Overlay.

Figure 5-2. Forest Management Areas.

Figure 5-3. Fort Wainwright Fire History.

Figure 5-4. Fire Management Areas.

Figure 5-5. Fisheries Management Areas

Figure 5-6. ADF&G Game Management Units

Figure 5-7. Habitat Management Areas.